33. The automation system (1) as claimed in claim 32, wherein the standard control device controls at least one safety-related output.

34. The automation system (1) as claimed in claim 32,

wherein the safety analyzer (5, 5', 5'') has a freely programmable logic device, which processes monitored safety-related data.

35. The automation system (1) as claimed in claims 32,

wherein the safety analyzer (5, 5', 5'') is not a logic bus subscriber in the automation system (1) and has at least one safety-related output (6) via which at least one bus subscriber (31-38) which is associated with the safety analyzer of the automation system is switched on or off.

36. The automation system (1) as claimed in claim 35,

a1

wherein the safety analyzer (5, 5', 5'') is set up for switching off at least one of a safety island, a bus spur (8), and the entire automation system.

37. The automation system (1) as claimed in claim 32,

wherein the safety analyzer (5') has at least one safety-related input (10), via which the safety analyzer is connected to a safety-related device (11) in the automation system for detecting safety-related data.

38. The automation system (1) as claimed in claim 32,

wherein the bus (2) is connected via an interface assembly (41) to a host (40), with the process-related control being arranged in the host, and the safety-related control being arranged in the interface assembly.

39. The automation system (1) as claimed in claim 32,

wherein the bus (2) is a serial bus, and at least one safety analyzer (5, 5') is arranged in a long-distance bus section of the automation system.

40. The automation system (1) as claimed in claim 38,

wherein a safety analyzer (5) is one of arranged directly after the host (40) or arranged after the interface assembly (41).

41. The automation system (1) as claimed in claim 38,

wherein a safety analyzer (5) is arranged in the interface assembly (41).

42. The automation system (1) as claimed in claim 32,

wherein the safety analyzer (5, 5', 5'') comprises a memory device for storing a process map.

43. The automation system (1) as claimed in claim 32,

a1 wherein the safety analyzer (5, 5', 5'') has a device for manipulating at least one of input data and output data transmitted on the bus (2).

44. The automation system (1) as claimed in claim 43,

wherein the device overwrites at least one of the input and output data in the safety analyzer (5, 5', 5'').

45. The automation system (1) as claimed in claim 43, wherein the device inserts data into the datastream.

46. The automation system (1) as claimed in claim 32,

wherein at least one safety analyzer (5, 5', 5'') is of redundant design.

47. A method for operating an automation system (1) as claimed in claim 32, comprising the following steps:

using a standard control device (4; 40, 41) for carrying out a process control with the processing of process-linked I/O data and safety-related data, and

carrying out processing of safety-related data in at least one safety analyzer (5, 5', 5'') with safety-related logic linking data in the bus datastream being processed in the safety analyzer.

48. The method as claimed in claim 47,

further comprising the step of using the standard control device to control at least one safety-related output.

49. The method as claimed in claim 47,

further comprising the step of comparing the safety-related logic linking data, which is transmitted via the bus, for at least one of the standard control device (4, 41) and at least one further safety analyzer (5, 5', 5'') with the corresponding logic linking data of the first safety analyzer, in a safety analyzer (5, 5', 5'').

a'

50. The method as claimed in claim 47,

further comprising the step of checking the logic linking data, which is produced by the standard control (4, 41) and is sent as output data via the bus in at least one safety analyzer (5, 5', 5'') by modeling the safety-related logic links of the standard control (4, 41).

51. The method as claimed in claim 49,

further comprising carrying out safety-related functions in response to the comparison by the safety analyzer (5, 5', 5'').

52. The method as claimed in claim 50,

further comprising carrying out safety-related functions in response to the checking by the safety analyzer.

53. The method as claimed in claim 47, further comprising the step of carrying-out a safety-related function via a safety-related output (6) of the safety analyzer (5, 5', 5'').

54. The method as claimed in claim 47,

further comprising the step of using the safety analyzer to carry out safety-related functions in response to the safety-related data detected via the safety-related input (10) of the safety analyzer (5').

55. The method as claimed in claim 54,

wherein the process of carrying out the safety-related function comprises switching a bus subscriber (32-38) on or off.

56. The method as claimed in claim 47,

a1 wherein the safety analyzer (5, 5', 5'') at least one of overwrites or deletes at least one data item into the datastream and inserts at least one data item into the bus datastream by means of a device for manipulating the datastream on the bus (2).

57. The method as claimed in claim 56,

wherein the safety analyzer (5, 5', 5'') at least partially stores the monitored datastream and copies input data in the bus datastreams to output data in the bus datastream, and vice versa.

58. The method as claimed in claim 47,

wherein safety-related data is transmitted via the bus (2) using a security protocol.

59. The method as claimed in claim 58,

wherein in addition to the safety data item, the security protocol comprises at least one of the negated safety data item, a sequential number, an address and data protection information (CRC).

60. The method as claimed in claim 47,

wherein the bus is a system operating on the master-slave principle, with data being transmitted between at least two slaves, by means of a data link via at least one safety analyzer (5, 5', 5''), with the safety analyzer copying data in the bus datastream.

61. The method as claimed in claim 60,

wherein the data is transmitted between individual bus subscribers (31-38).

62. The method as claimed in claim 47,

wherein the bus is a system operating on the master-slave principle, with data being transmitted between at least two slaves by means of a data link via the control or the master, with the control or the master copying data in the bus datastream.

63. The method as claimed in claim 62, wherein the data is transmitted between individual bus subscribers (31-38).

64. The method as claimed in claim 47,

wherein at least one of quality data is produced by means of a safety analyzer (5, 5', 5''), and the data which has been read is prepared for further processing.

65. The method as claimed in claim 47,

wherein the safety-related logic links used in a safety analyzer (5') are at least partially carried out in redundant form in at least one further safety analyzer (5''), and the same safety functions are at least partially carried out by the two safety analyzers.

66. The method as claimed in claim 47,

wherein a safety analyzer also at least partially carries out process data processing.